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(54) Title: METHOD, PROCESS, CHEMISTRY AND APPARATUS FOR TREATING A SUBSTRATE

Chemical and Physical Properties of Hydrogen Peroxide

Density - 1.46 g/ml
Boiling Point - 152 C
Critical Temperature - 457 C
Critical Pressure - 214 atm
Molar Enthalpy of Vaporization - 51 kJ/mole
Solubility Parameter - 46 MPa^{1/2}

(57) **Abstract:** The invention provides new methods for synthesis of percarbonic acid and methods of using percarbonic acid compositions for the treatment of substrates. The invention is particularly useful for cleaning, disinfecting and/or sterilizing a substrate using percarbonic acid or a percarbonic acid - carbon dioxide mixture. The invention further provides an apparatus suitable for use in the substrate treatment methods provided herein. The invention also provides methods and apparatus for the real time monitoring of the treatment processes provided herein.

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